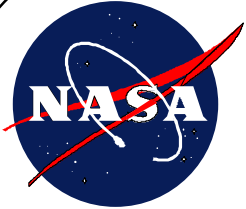


University Earth Systems Science (UnESS) Concept Study Report Guidelines

University of Maryland

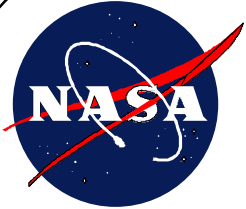
April 27, 2000



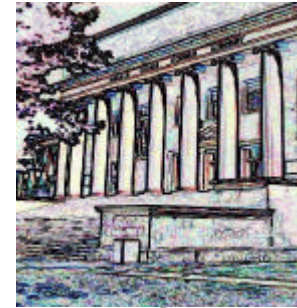
Concept Study Overview



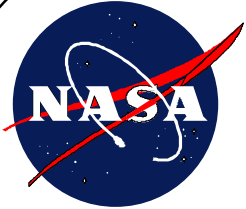
- ☐ 9 month study - May 1 to February 15, 2001.
- ☐ NASA will conduct a Downselect Process to select nominally two of these mission concepts for implementation and flight.
- ☐ Purpose: To provide your mission team the funding and additional time you need to better define the proposed investigation and its implementation, requirements and risks.
- ☐ Deliverable: Submit a Concept Study Report and provide a briefing to the evaluation team. NASA will base the evaluation for the NASA Downselect Process on your report and briefing.
- ☐ Guidance: *Guidelines for Concept Study Report Preparation*
(available in UnESS Library <http://uness.larc.nasa.gov/uness/unesslib.html>)



Downselect Select Evaluation Criteria



- ☐ NASA will use the same evaluation criteria to evaluate the Concept Study Reports for the Downselect Process as was used for the initial proposal evaluation.
- ☐ Refer to the evaluation criteria in the AO to ensure that the report addresses all of the factors identified in the evaluation. In addition, the AO, particularly Appendices C and D, may provide additional insight and examples that may be useful to your team.
- ☐ For purposes of these guidelines, mission phases are defined as follows:
 - Phase 1: Mission Concept Studies
 - Phase 2: Mission Definition and Preliminary Design
 - Phase 3: Mission Detailed Design
 - Phase 4: Mission Development and Launch
 - Phase 5: Mission Operations, Data Analysis, Archival, and Dissemination

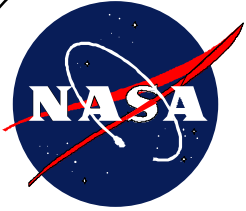


UnESS Concept Study Outline

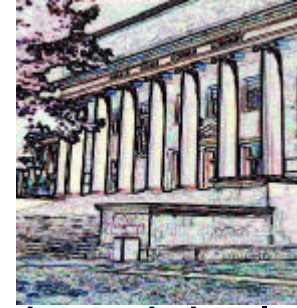


The Concept Study Report shall contain the following:

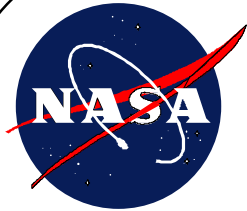
- A. Cover page
- B. Endorsements
- C. Table of Contents
- D. Section 1.0 Executive Summary (clearly identify changes from proposal and include the Investigation Summary Forms I and II from the AO);
- E. Section 2.0 Science/Applications Investigation (clearly identify changes from proposal);
- F. Section 3.0 Student Involvement Investigation Description (clearly identify changes from proposal);
- G. Section 4.0 Technical Implementation
- H. Section 5.0 Management;
- I. Section 6.0 Other Opportunities;
- J. Section 7.0 Mission Definition and Preliminary Design Study Plan;
- K. Section 8.0 Cost and Cost Estimating Methodology; Appendices.



Concept Study Guidelines



- ☐ If you have made changes to any data provided with the original proposal as a result of the concept study, you must clearly identify and explain these changes from the proposal in your study report.
- ☐ OES is committed to meaningful participation of Historically Black Colleges and Universities (HBCU), Other Minority Universities (OMU) including participation in both the scientific and student involvement aspects.
- ☐ NASA has limited the number of pages for the main sections of the report to 125 pages, with a maximum of seven foldout pages (28 x 43 cm; i.e., 11 x 17 inches).
- ☐ Provide to NASA ten copies of the report bound in loose-leaf binders. Also provide one set of diskettes containing electronic versions of your report on DOS-compatible.



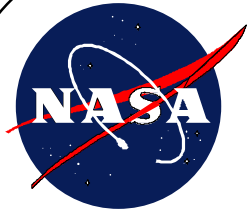
Page Limit Guidelines



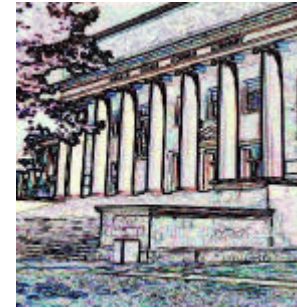
Section

Page Limit

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> Cover Page, Endorsement, Table of contents | No Limit |
| <input type="checkbox"/> Executive Summary | 25 pages |
| <input type="checkbox"/> Science/Application Investigation | 100 pages |
| Student Involvement Investigation Description | |
| Technical Implementation | |
| Management | |
| Other Opportunities | |
| Mission Definition and Preliminary Design Study Plan | |
| <input type="checkbox"/> Cost and Cost Estimating Methodology | No Limit /
Use formats |
| <input type="checkbox"/> Appendices | No Limit on
approved
Appendices |



Concept Study Guidelines



A. COVER PAGE

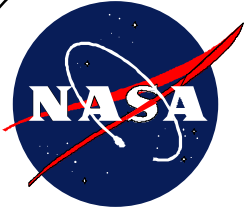
- The PI and an official by title of the investigator's organization that is authorized to commit the organization must sign this page.
- Include the full names, addresses with zip codes, telephone and fax numbers, and electronic mail addresses.

B ENDORSEMENTS

- Include endorsements for all co-investigators, lead team members, contributors, and non-U.S. participants .
- Include individual's signature, full name, address with zip code, telephone and fax numbers, and electronic mail address.
- NASA requires institutional endorsements for all contributions.

C TABLE OF CONTENTS

- Parallel the outlines provided in Table 1 and Sections D through M



Concept Study Guidelines

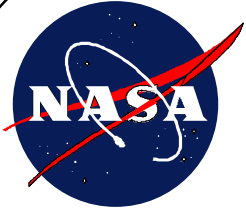


D. EXECUTIVE SUMMARY (Section 1)

- Provide overview of the investigation, including discussion of: scientific/applications goals and theme; student involvement; technical implementation; management plans; other opportunity plans; and, cost and cost estimating methodology.
- Clearly identify any changes to the mission since proposal.
- Include Investigation Summary Forms I and II as provided in the proposal.

E. SCIENCE/ APPLICATIONS INVESTIGATION (Section 2)

- Describe the science/application aspects of the investigation.
- Discuss and clearly identify (e.g., highlighted in bold or column marking for easy identification) any descoping of or changes to the investigation, including the rationale for the changes.
- If no changes, repeat this section identically from the proposal.



Concept Study Guidelines

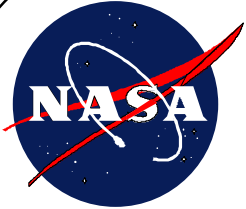


E. SCIENCE/ APPLICATIONS INVESTIGATION (Continued)

- Special attention: Assure that both the planning and resources described in report are adequate to analyze, interpret, archive and distribute all the data produced by the investigation to the scientific community.
- Identify the resources you require including the costs, schedule, and man-hours for scientific interpretation of the results of the investigation and their publication.

F. STUDENT INVOLVEMENT INVESTIGATION DESCRIPTION(Section 3)

- Describe the student involvement aspects of the investigation resulting from the concept study.
- Discuss any descoping of or changes to the original proposal, including the rationale for the changes.
- If no changes, repeat this section identically from the proposal.

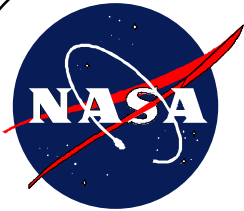


Concept Study Guidelines



F. STUDENT INVOLVEMENT INVESTIGATION DESCRIPTION (Section 3)

- Assure that both the planning and resources identified in Concept Study are adequate to support significant and meaningful hands-on student involvement in all phases of mission.
- Specifically identify the resources you require including costs, schedule, and man-hours.
- Discuss in detail all plans and required resources for the student involvement aspects of the investigation.
- *Mission teams should also comment on the concept of including non-science/engineering university schools (business, journalism, communications, education, graphic/fine art, law and etc.) in the mission and if this concept helps accomplish the goal of fostering the development of the next generation of Earth system scientists, engineers, managers, educators, and entrepreneurs.*

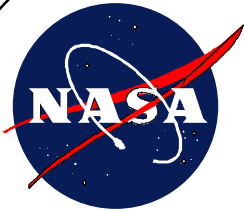


Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

- Detail the method and procedures for investigation definition, design, development, integration, ground operations, and flight operations.
- Provide a discussion of new technologies you will use for the investigation, including back-up plans with scheduled decision criteria for those technologies.
- Detail expected products and end items associated with each phase.
- Mission teams have the freedom to use their own processes, procedures, and methods.
- NASA encourages the use of innovative processes, techniques, and activities by mission teams in accomplishing their objectives provided you can demonstrate in your report that they will result in cost, schedule, and technical improvements.
- This section must be complete in itself without the need to request additional data.



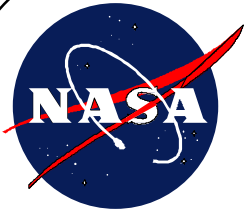
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.1 *MISSION DESIGN*

- Describe the operational phase of the mission from launch to end of mission.
- Clearly identify any changes to the mission design since the proposal.
- Include information on the planned launch vehicle, trajectories, Delta-V requirements, and a preliminary mission timeline indicating periods of data acquisition, data downlink, etc.
- Describe in the mission design the communication networks you plan to use and the interface requirements, along with potential impacts or conflicts with other users of the selected communications resources.
- Describe any design trade studies conducted or planned.
- Include a "traceability matrix" showing how your mission design complies with the stated objectives, requirements, and constraints of your investigation.
- Include the rationale for the selection of launch vehicle.



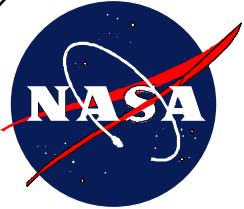
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.2 *INSTRUMENT IMPLEMENTATION*

- Describe in this section the science/ applications instrument (or instruments) for the investigation.
- Clearly describe any changes to the payload or individual instruments or their performance since submission of the proposal. Include information pertinent to the accommodation of the instrumentation on the spacecraft.
- Describe the subsystem characteristics and requirements including: mass, volume, and power requirements; pointing requirements; new developments needed; and a space qualification plan.
- Include where appropriate: block diagrams, layouts, calibration plans, operational and control considerations, and software development. Identify any design features incorporated to effect cost savings.
- Provide a summary of the resource elements of the instrument design concept, including key margins. Provide the rationale for margin allocation. Identify those design margins that are driving costs.



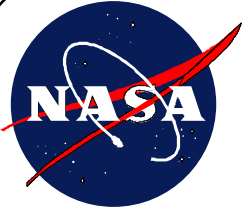
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.3 *INSTRUMENT INTERFACE AND PAYLOAD INTEGRATION*

- Characterize in this section the interface between the instruments and the flight system.
- Clearly identify any changes to the payload integration interfaces and processes since submission of the proposal. These interface requirements include but are not limited to: volumetric envelope, fields of view, weight, power requirements, thermal requirements, command and telemetry requirements, sensitivity to or generation of contamination (e.g., electromagnetic interference, gaseous effluents, etc.), data processing requirements, as well as the planned process for physically and analytically integrating them with the flight system.
- Discuss the testing strategy of the science/applications payload prior to integration with the spacecraft.



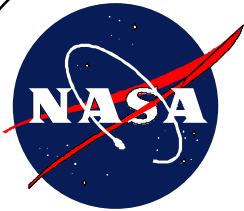
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.4 *SPACECRAFT*

- Describe in this section the spacecraft design approach, particularly as it relates to new versus existing hardware and redundant versus single-string hardware.
- Identify the spacecraft systems and describe their characteristics and requirements. Clearly identify any changes to the spacecraft or its performance since submission of the proposal.
- Include a description of the flight system design with a block diagram showing the flight element subsystems and their interfaces, along with a description of the flight software and the approach for its development, and a summary of the estimated performance of the flight system.
- Describe the flight heritage or rationale you used to select the flight system and its subsystems, major assemblies, and interfaces.
- Address (1) prior flight experience or flight-qualified design of specific subsystem components, and; (2) overall subsystem design, whether new, modified, or exact repeat of a design flown previously.



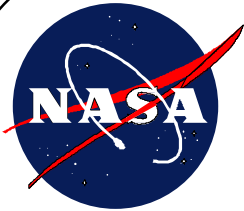
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.4 SPACECRAFT

- Discuss the design *process* you used: trade studies, simulations, technology development, engineering models, prototypes, etc.
- Quantify and explain in Section K the cost savings that result from heritage you describe in this section, providing cross-references as needed.
- Describe the subsystem characteristics and requirements, including current best estimate and contingency for: mass, volume, and power requirements; pointing knowledge and accuracy; new developments needed; space qualification plan; and logistics support.
- Provide a summary of the resource elements of the flight systems design concept including key margins.
- Provide the rationale for and derivation of margin allocations including mass, power, communication link, pointing accuracy, etc.
- Summarize in a Master Equipment List the component-level information for all hardware subsystems of the spacecraft, and instruments.



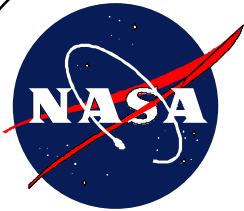
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.5 *LAUNCH SERVICE*

- Describe in this section your launch service selection.
- Identify the specific launch planned.
- If you cannot identify the specific launch, discuss the range of acceptable launch options, orbit parameters, and the likelihood that your mission will be able to find a ride in the timeframe identified in your report.
- If your investigation is a partial mission, describe the plans for the host mission. Include information on the launch option margins and reserves (volume, mass, etc.).
- If your mission proposal requires NASA to consult with the OSTP regarding National Space Transportation Policy, the NASA will initiate formal coordination with OSTP regarding the proposed mission concept.
- NASA cannot guarantee that OSTP concurrence will be provided for any given mission.



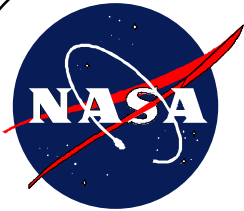
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.6 *MANUFACTURING, INTEGRATION AND TEST*

- Describe the manufacturing strategy to produce, test, and verify the hardware/software necessary to accomplish the mission.
- Include a description of the main processes/procedures planned in the fabrication of flight hardware, software, production personnel resources, incorporation of new technology/materials, and the preliminary test and verification program.
- Identify any changes to the manufacturing, integration and test processes or their performance since submission of the proposal.
- Discuss the planned environmental tests and specify the test margins and durations for the environmental test program.
- Define the part burn-in requirements that you will use for the program.
- Describe your approach for transitioning from design to manufacturing and the data products that you will use to assure producibility and adequate tooling availability.



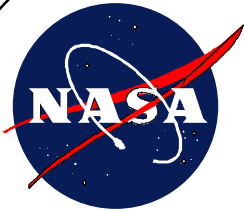
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.7 *MISSION OPERATIONS, GROUND AND DATA SYSTEMS*

- Discuss in this section your requirements for mission operations and the ground operations support.
- Discuss the planned approach for managing mission operations and all flight operations support, including mission planning.
- Describe all inter-facility communications, computer security, tracking, or near real-time ground support requirements, and indicate any special equipment or skills required of ground personnel.
- Provide a staffing plan for both mission operations and payload operations.
- Identify any changes to the mission operations, ground and data systems or their performance since submission of the proposal.
- Describe your approach to developing the ground data system, including the use of existing facilities such as Government facilities.



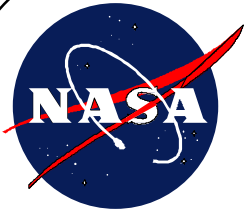
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.7 *MISSION OPERATIONS, GROUND AND DATA SYSTEMS(cont'd)*

- Explicitly describe all usage of the Tracking and Data Relay Satellite System (TDRSS).
- Adequately describe any mission-unique facilities. Include a block diagram of the Ground Data System (GDS) showing the end-to-end concept (acquisition through archiving) for operations and data flow to the subsystem level.
- Describe all communications, tracking, and ground support requirements.
- Describe the software design heritage and software development approach and its relationship to the flight system software development.
- Describe the use of any existing mission operations facilities and processes, as well as any new facilities that you require to meet the mission objectives.



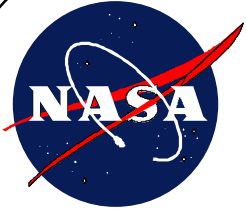
Concept Study Guidelines



G. TECHNICAL IMPLEMENTATION (Section 4.0)

G.8 NEW TECHNOLOGIES AND OPEN TECHNICAL ISSUES

- Identify and discuss in detail any new technology(s), technology development(s), or technology enhancement(s) that your investigation depends on, along with the risks involved and alternative approaches if the technologies are not ready for mission use.
- Discuss the value and justification to the four science questions. NASA encourages discussion of the plans for transferring these technologies to the private sector, including the non-aerospace sector.
- The **Office of Earth Science Integrated Technology Strategy** (<http://www.earth.nasa.gov/vision/index.html>) and
- the **NASA Technology Plan** (<http://actuva-www.larc.nasa.gov/techplan/>) describes the means by which NASA's Office of Earth Science plans to implement new technology.

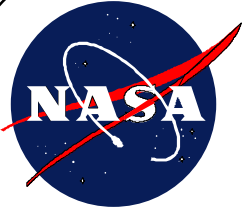


Concept Study Guidelines

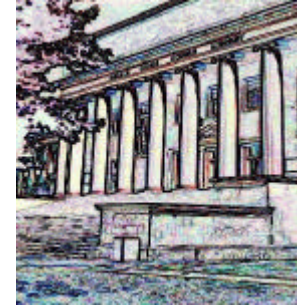


H. MANAGEMENT (Section 5.0)

- Identify approach for managing the work, identifying the essential management functions and the overall integration of these functions.
- Discuss the decision-making process that the team will use, focusing particularly on the roles of the Principal Investigator and Project Manager in that process.
- Provide insight through your management plan into the organizations identified for the work, including the internal operations and lines of authority with delegations, together with internal interfaces and relationships with NASA, major subcontractors, and associated investigators.
- Identify the institutional commitment of all team members and the institutional roles and responsibilities.
- *Identify management processes and tools that may be useful to NASA in the management of its programs and projects.*



Concept Study Guidelines



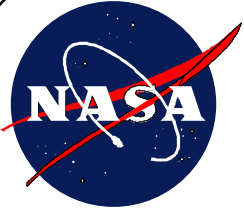
H. MANAGEMENT (Section 5.0)

H.1 MANAGEMENT PROCESSES AND PLANS

- Describe the management processes and plans and accompany this with a description of the work plan.
- Describe in the planned methods of hardware and software acquisition.
- Discuss planned management processes, including the relationship between organizations and key personnel.
- Clearly identify and discuss the benefits of unique tools, processes, or methods that will be used by the investigation team.
- Cover all project elements to assure a clear understanding of project-wide implementation.

H.2 SCHEDULES

- Define the schedule and workflow for the complete mission life cycle.
- Identify the schedules for all major activities.



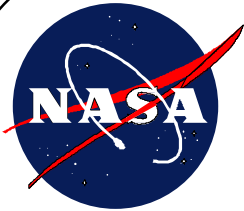
Concept Study Guidelines



H. MANAGEMENT (Section 5.0)

H.3 TEAM ORGANIZATION, STRUCTURE, AND EXPERIENCE

- Describe in the roles, responsibilities, time commitment, and experience of all team member organizations and key personnel.
- Indicate what percentage of time key personnel will devote to the mission.
 - a. Organizational Structure. Describe the management organizational structure of the investigation team.
 - b. Experience and Commitment of Key Personnel. Provide a history of experience explaining the relationship of the previous experience to each key individual's role. Principal Investigator, Co-Investigator(s), and Project Manager and Other Key Personnel. Describe the roles, responsibilities, time commitments, and experience of other key personnel in the investigation.



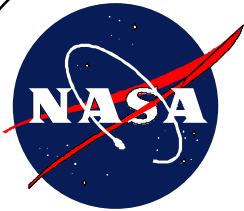
Concept Study Guidelines



H. MANAGEMENT (Section 5.0)

H.4 RISK MANAGEMENT

- Describe in this section the approach to and plans for risk management that the team will take, both in the overall mission design, technology development, and in the individual systems and subsystems.
- Discuss at least the top three risks and their mitigation plans.
- Identify a summary of margins and reserves in cost and schedule by phase and project element and year.
- Discuss the rationale for the margins and reserves.
- Define the specific means by which integrated costs, schedule, and technical performance will be tracked and managed.
- Describe the specific reserves and the timing of their application.
- Discuss the management of the reserves and margins. Strategy for maintaining reserves as a function of cost-to-completion.
- Discuss the relationship between the use of such reserves, margins, potential descope options, and their effect on cost, schedule, and performance.



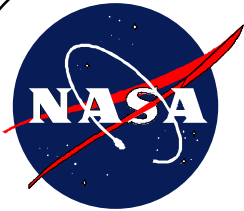
Concept Study Guidelines



H. MANAGEMENT (Section 5.0)

H.5 MISSION ASSURANCE AND SAFETY

- Describe plans to avoid loss of life, personal injury or illness, property loss or damage, or environmental harm from any of its activities.
- Each investigator should describe their program to develop safety, health, reliability, and quality assurance requirements needed for mission success.
- Occupational Safety and Health Administration (OSHA) requirements shall apply to NASA sponsored investigations.
- Describe safety reporting process for information concerning safety, health, risks, or quality assurance to NASA.
- Describe a quality management system to control and document processes assuring safety, quality and reliability of hardware, software, or service.
- ***Earth Explorers Program Mission Assurance Guidelines and Requirements*** and ***Earth Explorers Program Flight & Ground Safety Requirements*** in UnESS Library for Study preparation.



Concept Study Guidelines



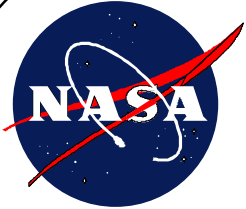
H. MANAGEMENT (Section 5.0)

H.6 FACILITIES AND EQUIPMENT

- Provide a description of any new, or modifications to existing, facilities, laboratory equipment, and ground support equipment (GSE).
- *H.7 GOVERNMENT FURNISHED EQUIPMENT, AND SERVICES*
- Delineate the Government-furnished equipment, and services you require to accomplish all phases of the mission.

H.8 REPORTING AND REVIEWS

- Describe approach for reporting progress to the Government and the reviews you will invite the Government to attend to provide independent oversight.
- Show how you have integrated the four required Government reviews into the reporting process for reporting integrated cost, schedule, and technical performance.
- Identify the information you will present for each report and review.



Concept Study Guidelines

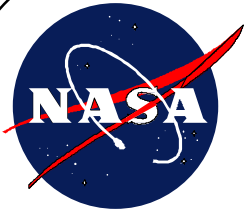


I OTHER OPPORTUNITIES (Section 6.0)

- Describe in the small disadvantaged business plan, education and public outreach plans, and plans for commercialization.
- Summarize the benefits offered by the mission beyond the scientific/applications and student involvement benefits brought by obtaining and analyzing the desired scientific data.
- Identify any changes to the plans since submission of the proposal.

I.1 EDUCATION AND PUBLIC OUTREACH

- Summarize the benefits offered by the mission beyond the scientific and education participation benefits.
- Discuss any planned K-16 educational activities that the mission will perform and include any educational outreach to students and faculty at HBCU and OMU.
- See OES' education and outreach approach in the ***ESE Educational Strategy Plan***.



Concept Study Guidelines



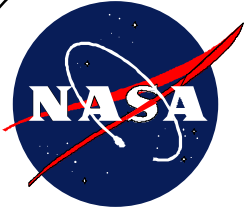
I OTHER OPPORTUNITIES (Section 6.0)

I.2 SMALL, SMALL DISADVANTAGED, AND MINORITY INSTITUTIONS

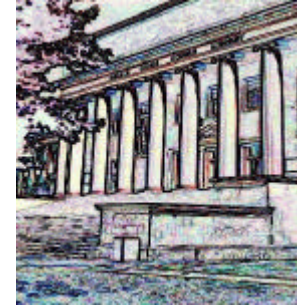
- Summarize the subcontracting plans for Small, Small Disadvantaged and Women-Owned Small Businesses, and Minority Institutions involvement in the implementation of the investigation.
- Discuss the subcontracting approach and state the subcontracting goals for small disadvantaged, women-owned, HBCUs and OMUs.
- NASA contracts resulting from this project which offer subcontracting possibilities, exceed \$500,000, and are with entities other than small business concerns, will contain the clause at FAR 52.219-9.

I.3 COMMERCIALIZATION

- Discuss the benefits and enhanced U.S. economic and technical competitiveness achieved through partnerships between the public sector programs and the private sector.



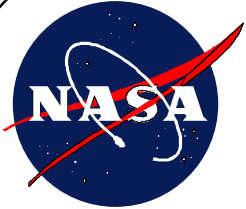
Concept Study Guidelines



J. MISSION DEFINITION AND PRELIMINARY DESIGN STUDY PLAN

(Section 7)

- Describe the means by which you will perform the mission definition and preliminary design study.
- Identify the key mission tradeoffs and options to investigate during the mission definition and preliminary design studies.
- Identify issues, technologies, and decision points critical to the mission success.
- Define the products of each phase and the schedule for their delivery to the team and/or Government.

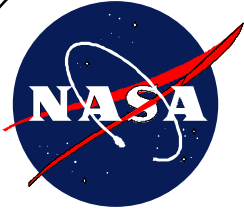


Concept Study Guidelines



K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

- Provide information on the anticipated costs for all phases of the mission .
- NASA requires a detailed cost estimate for the mission definition and preliminary design activities.
- NASA requires cost estimates for the follow-on phases, including a description of the estimating methodology you used to develop the cost estimates.
- Provide a discussion of the basis of the estimate with a discussion of heritage and commonality with other programs.
- Quantify and explain the cost savings that result from heritage.
- Include all costs, including all contributions to the investigation.
- Complete and provide a summary of total mission cost by fiscal year as shown in Table L-1. Show all cost items in Table L-1 in Real Year dollars.
- **If obligation authority in excess of identified costs is required,**

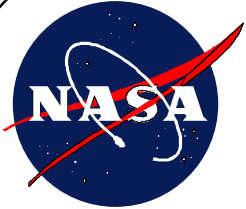


Concept Study Guidelines



K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

- Provide for each phase of the investigation a Time Phased Cost Breakdown for each Work Breakdown Structure (WBS) element, as shown in Table L-2.
- Summarize on one page and presented in the format shown in Table L-3 the cost in Real Year dollars of the entire project.
- Identify each reserve amount to the lowest level consistent with your planned reserve management strategy. For example, if each subsystem manager will have spending authority over a reserve for the subsystem, you should identify each such amount separately.
- Show costs for all development elements by recurring and non-recurring components in the format of Table L-4.
- Document all contributions provided by NASA Centers, including Civil Servant services, as well as the cost for the use of Government facilities and equipment. Fully cost and account for all direct and indirect costs associated with the work performed at NASA Centers.

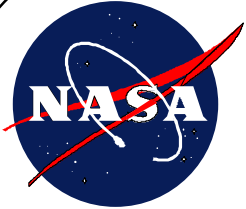


Concept Study Guidelines



K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

- Teams should work with the Office of the Chief Financial Officer at the respective NASA Centers to develop estimates for these costs.
- Use the inflation index provided in the AO Appendix to calculate all real-year dollar amounts, unless you use an industry forward pricing rate.
- Include in all costs all burdens and profit/fee in real-year dollars by fiscal year, assuming the inflation rates used by NASA or specifically identified industry forward pricing rates.



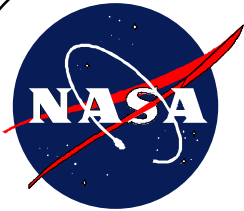
Concept Study Guidelines



K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

K.1 MISSION DEFINITION AND PRELIMINARY DESIGN COST ESTIMATE

- Provide a detailed cost estimate for performing the mission definition and preliminary design study.
 - a. Work Breakdown Structure. Include a Work Breakdown Structure (WBS) for the study phase of the mission.
 - b. Workforce Staffing Plan. Provide a workforce-staffing plan that is consistent with the Work Breakdown Structure.
 - c. Mission Cost and Cost Estimating Methodology. Describe the process and methodologies you used to develop the costs for the mission definition and preliminary design, and mission detailed design phase.



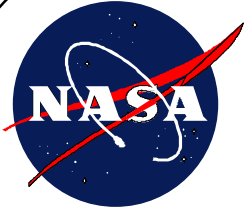
Concept Study Guidelines



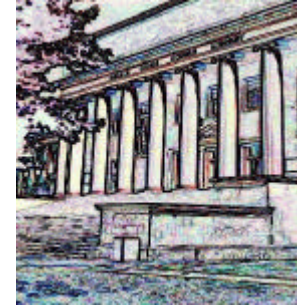
K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

K.1 MISSION DEFINITION AND PRELIMINARY DESIGN COST ESTIMATE

- Provide a detailed cost estimate for performing the mission definition and preliminary design study.
 - d. Mission Definition and Preliminary Design, and Mission Detailed Design Time-Phased Cost Summary. Provide a summary of the total mission definition and preliminary design, and mission detailed design phase costs consistent with Table L-2, Table L-3, and in Table L-4.
 - e. Cost Elements Breakdown. NASA requires costs and supporting evidence stating the basis for your reported costs to effectively evaluate your mission definition and preliminary design, and mission detailed design phase cost estimates.



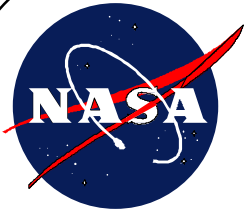
Concept Study Guidelines



K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

K.2 MISSION DETAILED DESIGN, AND MISSION DEVELOPMENT AND LAUNCH COST ESTIMATE

- Provide a cost estimate for performing the mission-detailed design, and mission development and launch portion of the mission.
- Correlate the cost estimate with the plans set forth in the Science/Applications and Student Involvement Investigation Discussion, Mission Implementation, and Management sections of the study.



Concept Study Guidelines

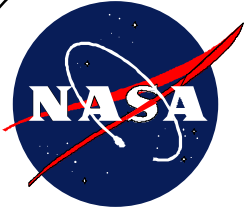


K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

K.2 MISSION DETAILED DESIGN, AND MISSION DEVELOPMENT AND LAUNCH COST ESTIMATE

• Apply the following guidelines in completing this section:

- a. Work Breakdown Structure. Include a WBS for the mission-detailed design, and mission development and launch phases of the mission. Describe the WBS to the subsystem level.
- b. Cost Estimating Methodology. Describe the process and methodologies used to develop the mission detailed design, and mission development and launch phase cost estimates.
- c. Workforce Staffing Plan. Provide a workforce-staffing plan (including civil service) that is consistent with Work Breakdown Structure.
- d. Mission Detailed Design, and Mission Development and Launch Time-Phased Cost Summary. Provide a summary of the total costs.



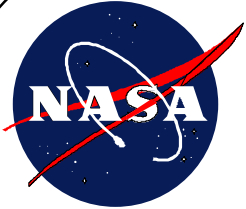
Concept Study Guidelines



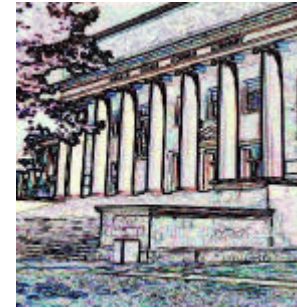
K. COST AND COST ESTIMATING METHODOLOGY (Section 8)

K.3 MISSION OPERATIONS AND DATA ANALYSIS, ARCHIVAL, AND DISSEMINATION

- Provide a cost estimate for performing the mission operations and data analysis, archival, and dissemination.
- If you plan to use NASA mission operations and communications systems then refer to ***NASA's Mission Operations and Communications Services*** document in the UnESS Program Library .

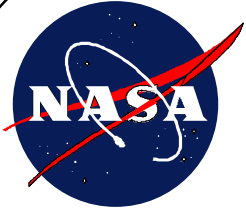


Concept Study Guidelines

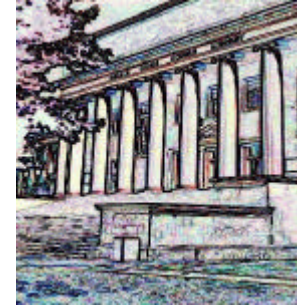


K.4 TOTAL MISSION COST (TMC) ESTIMATE

- Summarize the estimated costs your mission will incur in all phases of the mission, including:
 - Mission Definition and Preliminary Design,
 - Mission Detailed Design,
 - Mission Development and Launch, Mission Operations
 - Data Analysis, Archival, and Dissemination;
 - launch vehicle, upper stages, and launch services;
 - ground system costs;
 - student involvement costs
- Develop the total mission cost estimate consistent with the Work Breakdown Structure.
- a. Total Mission Cost. Summary of the Total Mission Cost time-phased by fiscal year in the format shown in Table L-1. Show dollar amounts in real-year dollars. Summarize Total Mission Costs in real-year dollars in the last column of this table.



Concept Study Guidelines



L. APPENDICES

NASA requires the following additional information with the Concept Study Report. NASA will not count these pages against the specified page limit.

- ____ Resumes
- ____ Letters of Endorsement
- ____ Mission Definition and Requirements Agreement
- ____ Certifications
- ____ Statement(s) of Work for each Contract Option
- ____ Incentive Plan
- ____ Relevant Experience and Past Performance
- ____ International Agreement(s)
- ____ Additional Cost Data
- ____ References List
- ____ Acronyms List